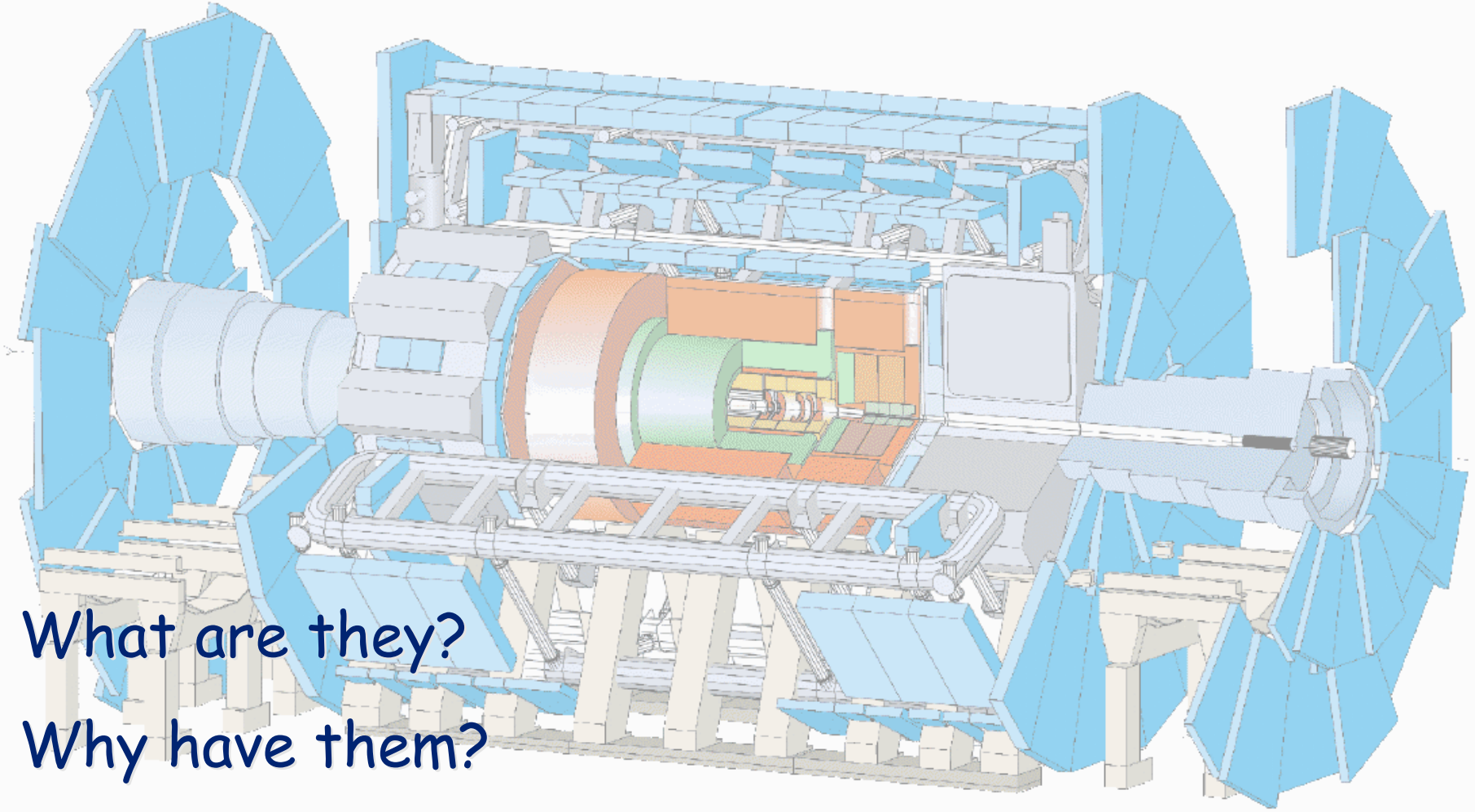
Secondary RoIs



What are they?

Why have them?

Is our current design optimal?

What is a "secondary RoI"?

Any RoI not involved in trigger decision

- 2E15I both e/ RoIs "primary"
- 1MU6 + 1E15I e/ RoI would be "secondary"

An RoI may be necessarily secondary:

- Low-E_T object (probably unisolated)
- Not used anywhere in CTP trigger menu
- May be used to guide additional selection in Level-2
  - use secondary e/ or jet RoI to guide LVL2 B triggers
  - use secondary e/ to ensure full readout of H 4e at high lumi (where may prescale Z ee)

Current Implementation

Nothing Special

- Just set desired thresholds
- Will send multiplicity to CTP (which will ignore it)
- Our electronics makes no distinction between "primary" and "secondary" selections

Is there a problem?

- Would use 1/8 of our thresholds & Calo CTP bandwidth
- Not a problem provided have spare capacity
- May be tension between this and other trigger menu demands

Is there an alternative?

Yes, in principle

- add an extra e/□ & □/h threshold
  - cluster E_T only, no isolation?
- do not output "hits" to CTP
  - those 48 (16□3) bits are a finite resource
- these additional thresholds only generate RoIs
- no longer have "spare" bits in RoI word format
  - would we have to lengthen the RoI word?
  - could we encode it somewhere (e.g. in 4-bit "RoI type")?

Is it possible?

- Well, it wouldn't require any hardware changes…

Summary

The issue is "necessarily secondary" RoIs

- some RoIs types may be primary or secondary in different events

Our current design can accommodate these

- by treating them as any other selections

There is some inefficiency

- "wastes" 6/48 of the bits we send to the CTP

There could be an alternative

- which we can use if we need it
- hard to assess need at present (but will most likely be pressures at some point)

Triggering on "mini black holes"

Is it difficult?

- Shouldn't be:
  - large production cross-sections
  - high-multiplicity (> 4), very-high p_T decay products
  - flavour-blind decays high lepton:hadron ratio

Can we do it?

- Erm, yes
  - the trick is to design a trigger menu which would miss these!

Is it important?

- Probably not…